

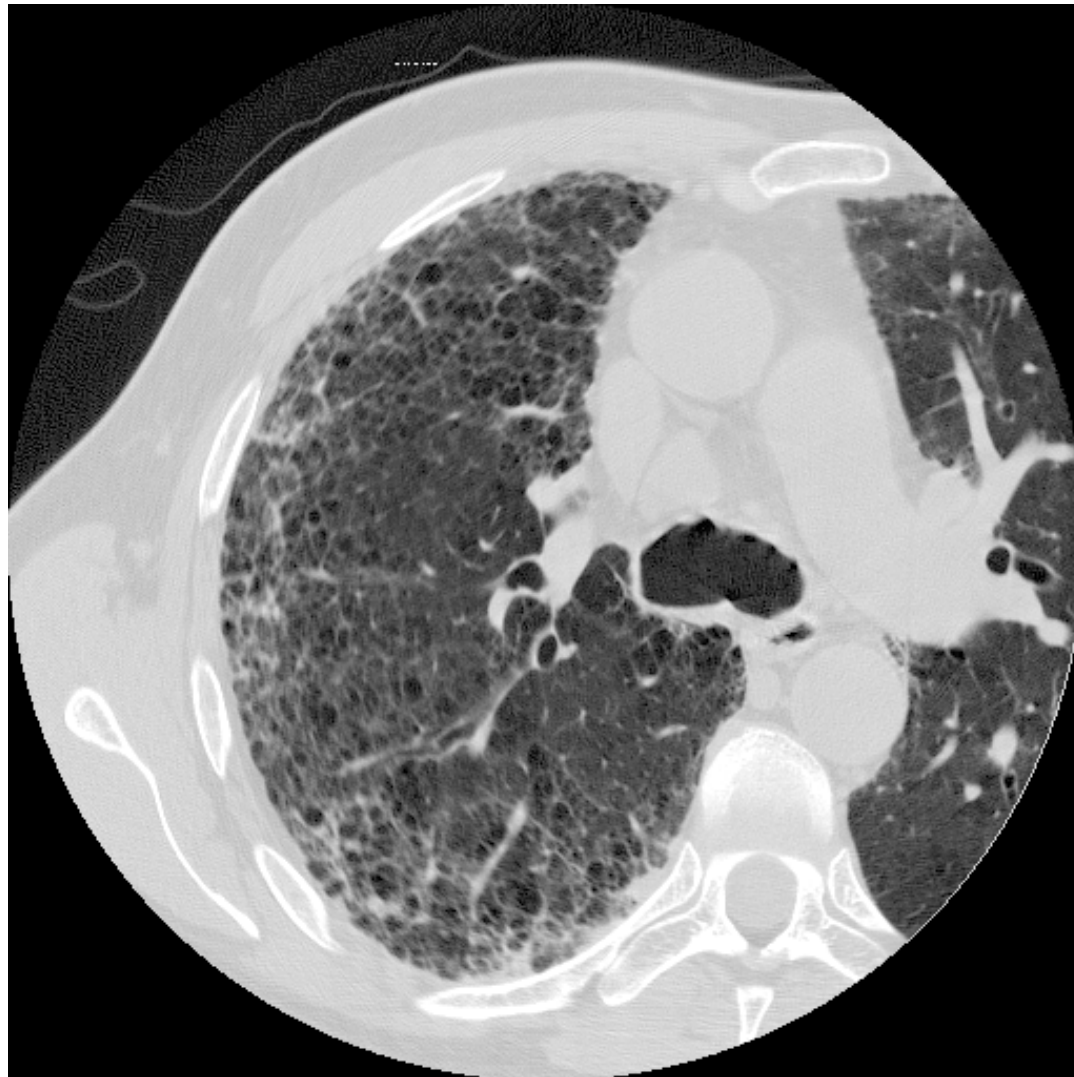
CANDID: Comparison Algorithm for Navigating Digital Image Databases

- Analogous to N-gram approach for comparing textual documents.
- Every image is described by a ``global signature'' containing texture, shape, and/or color information.
- Signatures are in the form of probability density functions over a pre-selected feature space.
- Signatures are compared with a distance measure or a similarity measure for continuous functions.
- Not restricted to imagery. Can be used for describing/comparing other large data sets (i.e. speech recognitions, 3-D texture comparison).

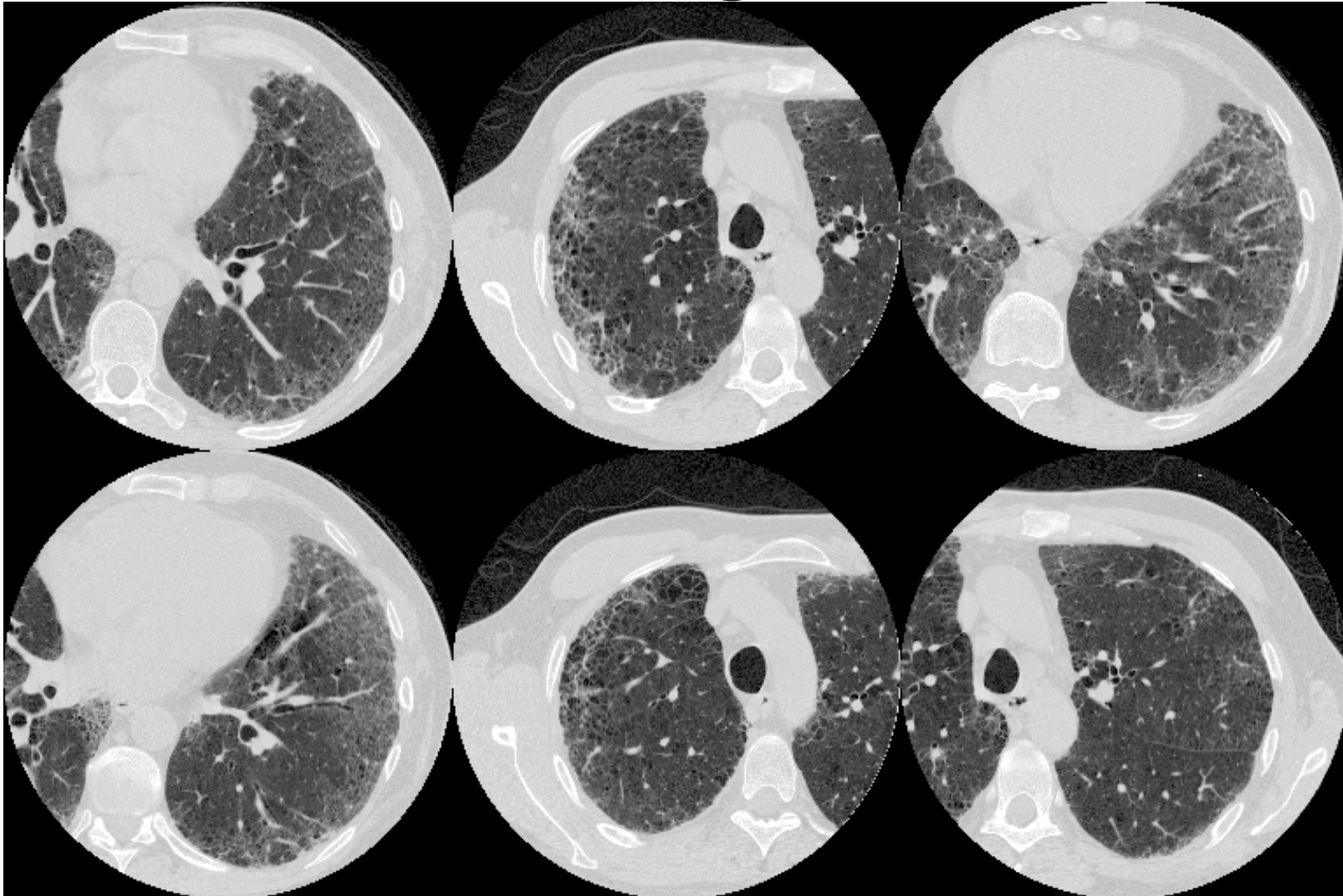
Application of CANDID to Medical Imagery

- **Enable radiologists to retrieve past case files from a database where CT imagery exhibits the same pathology as current study.**
- **Digital imagery can be retrieved in ways not currently available.**
- **Results for pulmonary CT imagery indicate that CANDID performs well when searching for lungs afflicted by similar disease.**

Target CT Image of patient



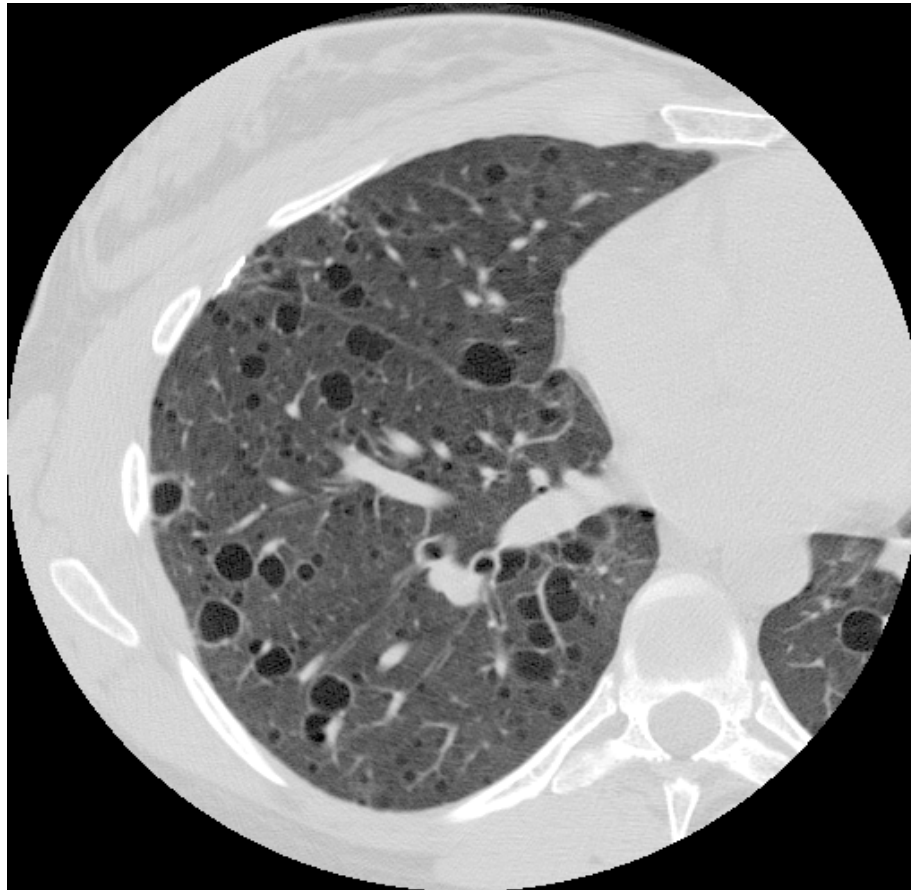
Best six matches from 152 images



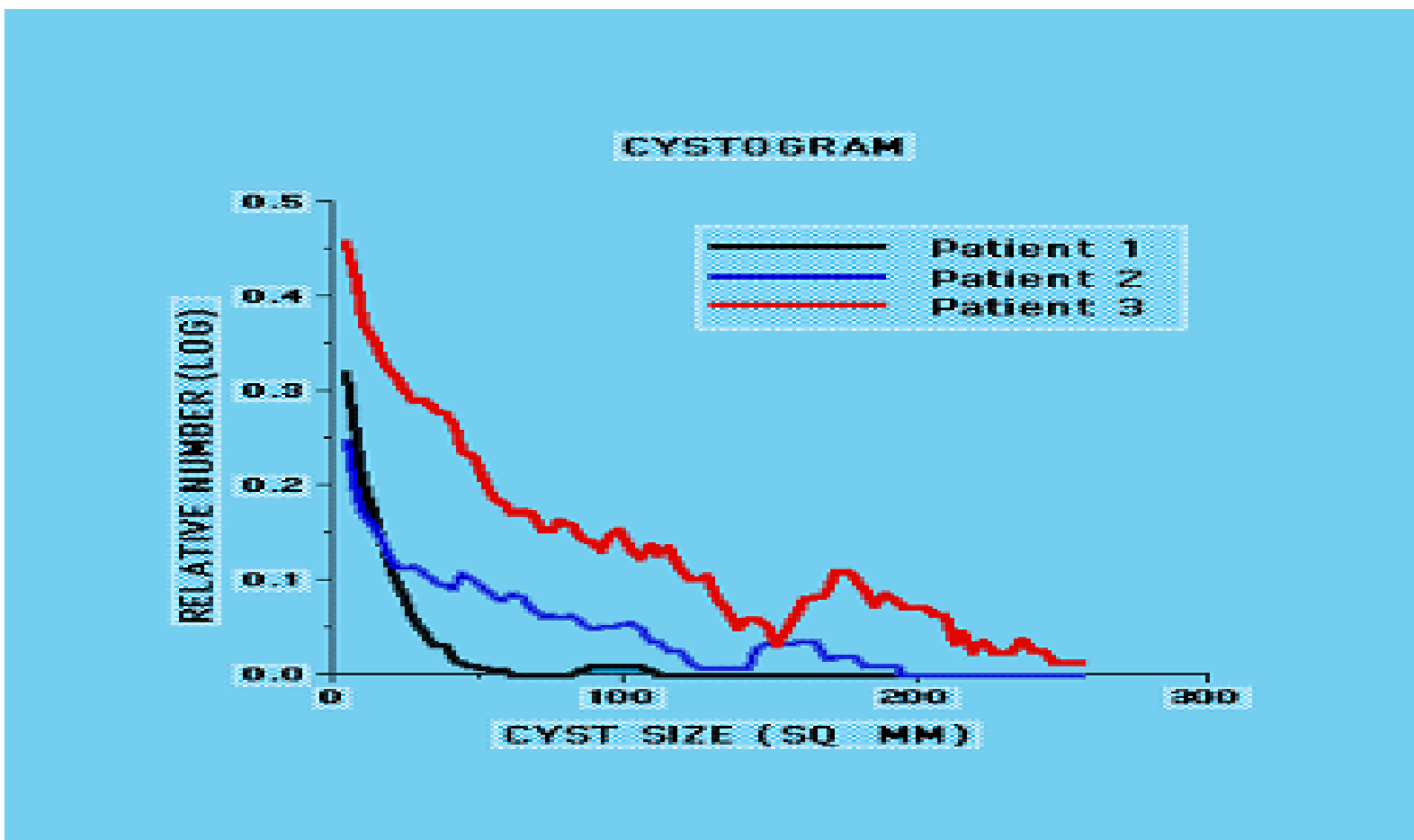
Quantitative Radiology

- **Compute reproducible, quantitative measurements from digital medical imagery (i.e. Percentage of Diseased Tissue in Lung).**
- **Aid in diagnosing patients as well as in tracking disease progression during drug treatment.**
- **Lymphangiomyomatosis (LAM) causes empty cysts in the lung. Generate cyst histogram as supplemental information to a radiologist's visual inspection of the imagery.**
- **Scleroderma causes the proliferation of a "chicken wire effect" in the tissue along the lung periphery. Compute the total area of the diseased portion of the lung.**
- **Near Fatal Asthma involves inflammation and narrowing of the pulmonary airways. Pixel brightness histograms depict the stage of disease.**

LAM CT Image



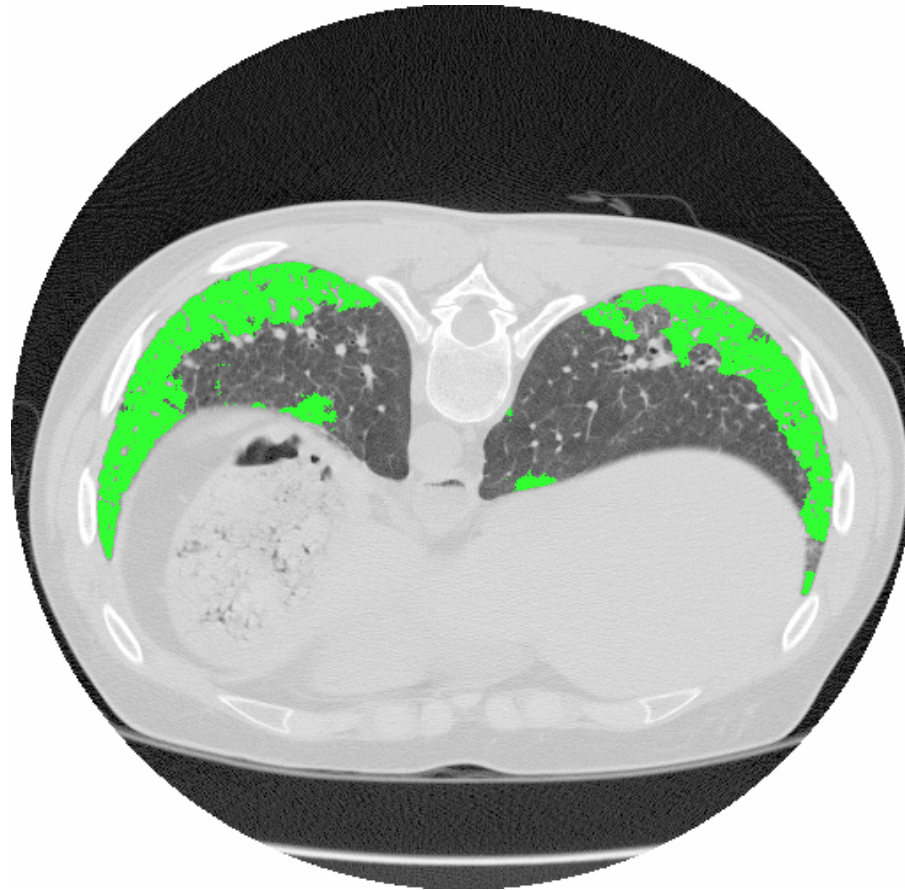
LAM Cystogram



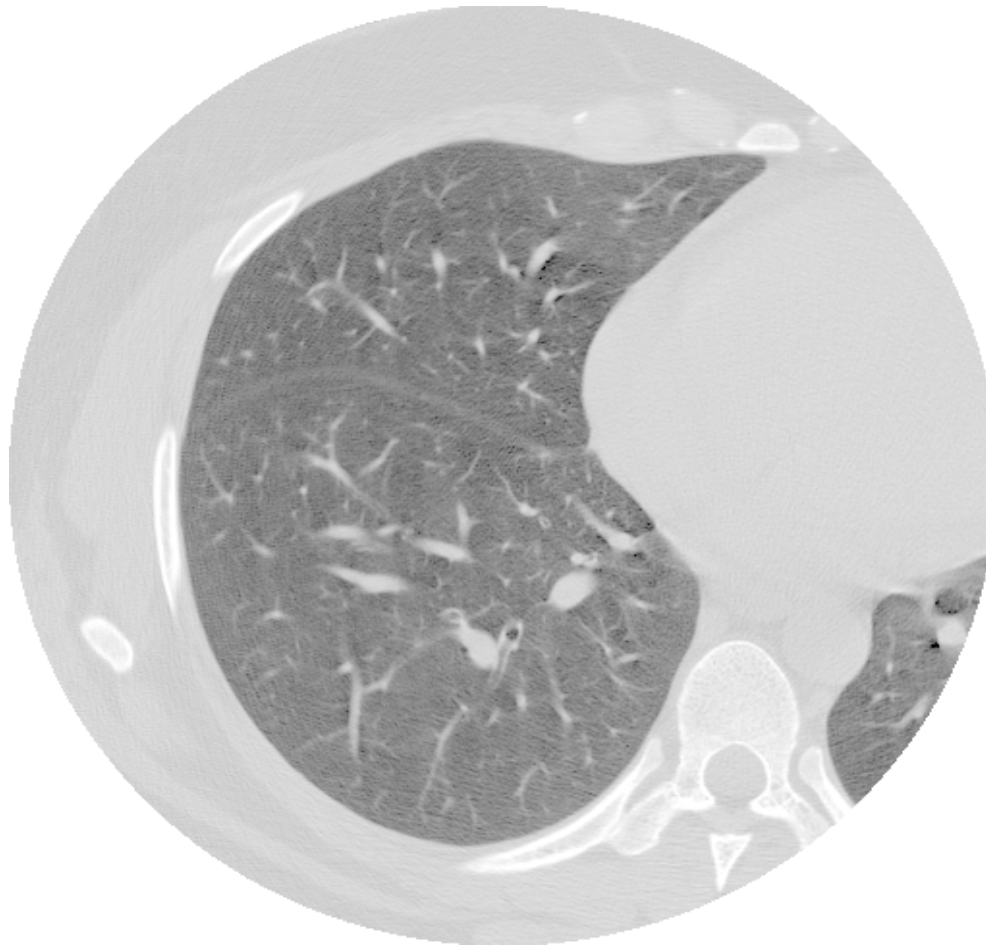
Scleroderma Image before Segmentation



Scleroderma Image after Segmentation



Asthma CT Image



Asthma Pixel Histogram

